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BEAN GROWING

IN NORTHERN IDAHO EASTERN WASHINGTON & EASTERN OREGON

DRY BEANS can be successfully produced in certain districts of northern Idaho, eastern Washington, and eastern Oregon without seriously interfering with the production of wheat, the major industry in these districts.

Thousands of acres that now lie idle as summer fallow each year are well adapted to bean growing. At slight additional expense and with practically the same equipment they can be made to produce about 600 to 800 pounds of beans per acre. Experience has shown that about as good cereal crops can be grown after beans as after ordinary summer fallow in these districts. The cultivation of the bean crop replaces the work necessary to care for the summer fallow and leaves the soil in excellent condition for planting winter wheat. Beans are usually harvested in ample time to permit fall seeding. Like many other minor crops, however, the production of dry beans can be expanded far beyond our domestic needs.

There was a substantial upward trend in both the production and the consumption of dry beans in the United States from 1922 to 1930. Probably because of the effects of the depression and heavy production, bean prices dropped sharply during 1930, 1931, and 1932 (tables 1, 3, and 5).

This bulletin describes the methods followed by successful bean growers, showing that, where sufficient moisture for crop production is present and few or no frosts occur between May 20 and September 15, beans have been incorporated into the cropping system with profit.

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BEAN GROWING IN NORTHERN IDAHO, EASTERN WASHINGTON, AND EASTERN OREGON[1]

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DISTRICTS SUITED TO BEAN CULTURE

BEAN GROWING may well be given greater consideration in certain northwestern districts. The districts lying along the foothills of the Craig Mountains and adjacent to the canyons of the Clearwater and Potlatch Rivers in Nez Perce, Lewis, and Latah Counties, Idaho, and along the foothills of the Blue Mountains in Umatilla County, Oreg., and Walla Walla, Columbia, and Garfield Counties, Wash., are well adapted to the production of beans. There are also a few districts in Whitman, Spokane, and Stevens Counties, Wash., where the climatic conditions are favorable for bean culture. Though only a limited area is especially adapted to this crop, a careful study of all the details of its production shows that there are thousands of acres now lying idle each year as summer fallow which might be used for producing beans as a row-tilled crop.

FACTORS FAVORING BEAN PRODUCTION

Two factors are largely necessary to the successful growing of beans: The annual rainfall must be sufficient to produce a crop each year, and the growing season from May 20 to September 15 must be approximately free from frosts. Because they are near the mountains these districts receive enough rain to grow beans if proper cultural methods are used.

The deep ravines leading down from the mountains in these districts give protection from frosts during the growing season by furnishing excellent air drainage. Danger from frost generally increases with the elevation, but air drainage is the principal regulating factor. In parts of Nez Perce County, Idaho, where the deep canyons furnish good air drainage, beans are being grown successfully at an elevation of 3,000 feet. In other parts of the same county having a lower elevation, but poor air drainage, this crop cannot be grown on account of the late spring and early fall frosts.

[1] A part of this material was issued in 1913 as Farmers' Bulletin 561 by L. W. Fluharty. In 1917 and 1922 the bulletin was revised by Byron Hunter and reissued as Farmers' Bulletin 907. In 1927 it was again revised and, with much added material, issued as Farmers' Bulletin 1509. This is a further revision.

Special acknowledgment is due C. W. Hungerford and H. W. Hulbert, of the Idaho Experiment Station, for valuable suggestions made in regard to this revision.

Three further factors, largely within the control of the farmer, affect the success of the bean crop: The quantity of moisture stored in the soil at the time of planting, the methods used in growing and harvesting the crop, and the presence of the nodule-forming bacteria in the soil.

ADVANTAGES OF GROWING BEANS

In parts of Latah, Nez Perce, and Lewis Counties, Idaho, beans have been grown for as much as 30 years, usually in alternation with wheat, and production there passed the experimental stage long ago. Experience has shown that about as good cereal crops can be grown after beans as after an ordinary summer fallow. Cultivation of the bean crop replaces the work necessary to care for the summer fallow and leaves the soil in excellent condition for planting winter wheat. Beans are usually harvested in ample time to permit fall seeding.

Beans do not seriously compete with wheat for labor and the two crops can be grown with practically the same equipment. From $250 to $300 worth of extra machinery is needed to plant, harvest, and cultivate from 70 to 80 acres of beans instead of cultivating the land as summer fallow. With the wage for man and horse labor and the price of bean seed that prevailed in 1925, for instance, it cost about $11 per acre more to plant, cultivate, and harvest a bean crop than to perform the tillage operations necessary to summer-fallow the land.

MAINTAINING SOIL PRODUCTIVITY

The soils of the bean-growing districts are generally well supplied with the mineral elements necessary for plant growth. Under such conditions the maintenance of soil fertility will depend almost entirely on keeping up the organic matter of the soil. This is not easily accomplished when beans and the cereal crops are grown exclusively. In fact, experience has thoroughly shown that the organic matter of the soil is gradually becoming depleted under the 2-year rotation of wheat and beans.

The permanency of the agriculture of the bean-growing districts to which this bulletin is applicable would be increased materially by the introduction of alsike clover, biennial sweetclover, or alfalfa into the cropping system.

Alsike clover, if grown both for improving the soil and for a seed crop, appears to be the most satisfactory of the three crops just mentioned for the more humid portion of the bean area of northern Idaho. The clover is planted with small grain in the early spring and is then used 1 or more years for seed production, provided a satisfactory stand is obtained. After the clover is plowed up the land is devoted to the production of beans or other crops.

Biennial sweetclover may be used as the soil-improving crop in a 3-year rotation by seeding it with small grain in the early spring. The grain is harvested in the usual way, and the next year the clover is used for pasture and for hay. The following year the land is in beans. Where alfalfa is the soil-improving crop the land is devoted to the production of alfalfa continuously for 4 or more years and then to the production of beans and wheat.

METHODS OF PRODUCTION

PREPARING THE SEED BED

Success of the bean crop depends largely on the thorough preparation of the seed bed. Beans are not planted until danger of the late spring frosts has passed, about the 1st of June. This encourages slighting the tillage of the bean land until after the rush of planting all the other crops. To guard against such neglect, bean growers should have two very definite aims in view in handling the soil prior to planting the crop:

1. The maximum amount of moisture should be stored in the soil at the time the bean crop is planted, because, as a rule, the rainfall that comes after planting time is rather scant. Moisture is lost from the soil in large quantities when volunteer wheat and weeds are allowed to make considerable growth in the spring before the land is prepared for planting beans.

2. Tillage operations before planting the crop should (1) destroy at least two crops of weeds and (2) prepare a moist, mellow, firm seed bed in which the seed will germinate quickly. With this accomplished, the handwork and cultivation necessary to grow the crop and keep it clean will be materially reduced.

The rush of the spring work on many farms makes it advisable to do considerable plowing in the fall as soon as the soil has become moist enough to be worked. Bean land that is plowed in the fall is left rough as it comes from the plow until spring. When dry enough in the spring, the soil is stirred once or twice with a disk or other suitable implement. A loose surface mulch is then maintained until planting time, to destroy weeds and prepare the seed bed. The amount and kind of cultivation required each year depend largely on the weather and soil conditions.

Many of the most successful bean growers of northern Idaho start the spring work by thoroughly disking the land to be planted to beans. No further tillage is then given until the seeding of the small-grain crops is completed. Attention is then turned to the bean land, and its condition determines whether it is harrowed before it is plowed. Harrowing is usually good practice, but it is not done unless the advantages are very evident. The tillage given after the land is spring-plowed depends much upon the weather and the dampness of the soil. If the weather is fair and the soil is sufficiently dry as it comes from the plow, the land may be harrowed immediately and packed with a corrugated roller or cultipacker. But if the weather is damp and the surface soil is rather wet as it comes from the plow, the harrowing and packing are postponed until the soil is in proper working condition.

PLANTING

The time of planting varies from May 20 to June 10, according as the season is early or late. If the seed is planted too early, cold weather, together with an excessive quantity of moisture in the soil, often causes the seed to decay before germination. Even if a good stand is obtained under such unfavorable conditions the crop usually develops and ripens very unevenly.

If the land to be planted is comparatively level and free from weeds and there is sufficient rainfall, the largest yields are obtained by planting the beans in rows 28 inches apart and dropping a bean every 2 to 3 inches in the row. If planted this way the beans will ripen a little

earlier and more evenly and the quality will be more uniform. If the ground is so foul as to require extensive cultivation, the beans should be planted in checks with the hills 30 inches apart each way. About seven beans should be planted in each hill. If planted in this way, the beans can be cultivated in two directions. Land that will require only a medium amount of hoeing may be planted in rows 30 inches apart with hills about 15 inches apart in the rows. An average of seven beans should be planted in each hill. The large-seed varieties require more pounds of seed per acre than those having small seed.

It is essential that the number of plants grown on a certain area be sufficient to maintain a proper balance between the soil moisture and the moisture requirements of the plants. If this balance is properly maintained the beans ripen evenly and a uniform crop is produced. In the sections in which beans are being grown at present, from 6 to 8 seeds in each hill produce the proper number of plants. If a smaller

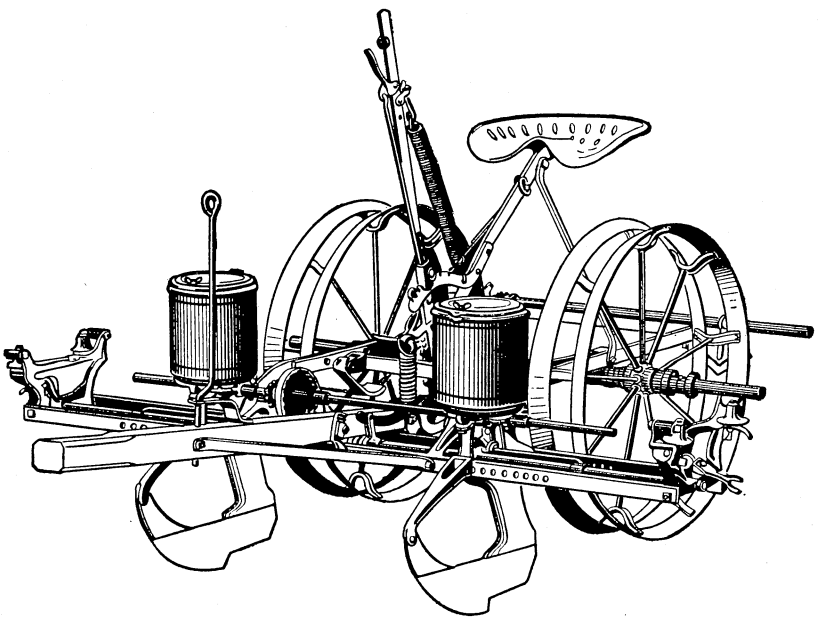

FIGURE 1.—A double-row bean or corn planter.

number of seeds is planted in each hill there is often moisture enough in the ground to keep the vines growing late in the fall and the late beans are sometimes damaged by early fall frosts. This problem must be worked out for each locality according to its soil and moisture conditions.

On very steep land the rows should run straight up the hill. If the surface of the field to be planted slopes in more than one direction, it is frequently advisable to change the direction of the rows so they will run straight up the hill on the steepest parts of the fields. This makes it much easier to cultivate and harvest the beans.

The double-row bean and corn planter is used almost exclusively for planting the crop. An excellent type of planter is shown in figure 1. This planter may be adjusted to plant in rows from 28

to 44 inches apart. By using a special 30-inch wire it will also plant the hills in 30-inch cross checks. The feed plates can be made to drop the desired number of seeds in each hill by regulating their speed. The planter is equipped with an automatic hill-drop attachment which drops the hills from 17 to 52 inches apart in the row.

A hand corn planter is often used for planting if only a small acreage is to be grown. The ground is marked off in checks about 30 inches square, and the beans are dropped at the intersection of the marks. An experienced man can plant from 4 to 7 acres a day by this method. If the ground is free from weeds, so that little cultivation is necessary, the seed is often planted in drill rows with either a bean planter or an ordinary grain drill. Of the two, a bean planter that has a drill attachment is the more desirable.

A grain drill having feed cups that will handle beans can be used with fair success. An 11-row grain drill with spaces of 7 inches between the grain tubes can be adjusted for drilling beans in rows 28 inches apart by stopping up all of the feed cups except the second, sixth, and tenth. The machine is so regulated as to plant the seed from 3 to 6 inches apart in the row.

The depth at which the beans are planted depends upon the character of the soil and the weather conditions. They are not planted so deep in dark, heavy soil as in a lighter soil. Beans cannot be planted to a very great depth during cold, damp weather without injuring the stand. The safe plan is to plant just deep enough for the seed to lie in moist earth, for an even stand of strong, healthy plants is one of the first requirements of a good bean crop.

INOCULATION

For the successful culture of beans there must be nodule-forming bacteria in the soil. If these bacteria are present they form on the roots of the bean plants little lumps called nodules. By the aid of the bacteria living in the nodules the bean plants are able to assimilate atmospheric nitrogen. Without the help of these bacteria they must obtain their nitrogen from the soil. If the nodule-forming bacteria are not present in the soil they can be supplied by pure-culture inoculation. Pure-culture inoculation material is furnished to farmers by the University of Idaho, the Washington State College, and the Oregon Agricultural College. The United States Department of Agriculture furnishes it in small quantities for demonstrational purposes. Directions always accompany the pure-culture inoculating material.

CULTIVATION

A thorough preparation of the seed bed leaves the soil in excellent tilth, destroys most of the weeds, and materially lessens the cultivations necessary after the beans are planted. The number of cultivations depends upon so many factors that no fixed rule can be made to apply to every case. For this reason the statements that follow must be taken in a general sense.

If the ground is very foul the shovel cultivator is run immediately behind the planter. In 2 or 3 days, or just before the plants begin coming through the ground, the field is cultivated with a drag harrow. The harrow destroys the small weeds, levels the surface of the ground, and puts the soil in splendid condition to be cultivated as soon as the

plants are large enough. If weed seeds germinate at the same time as the beans, the ground is harrowed again after the plants are up.

Some growers fear to use the harrow lest they injure the stand by breaking off the young plants. Very little damage is done, however, if the seed bed has been so well prepared that the ground is level and free from clods. Less damage will result if the harrowing is done when the surface soil and the bean plants are rather dry, as the young plants are more brittle when moist than when dry.

One harrowing, either before or after the plants are up, is enough if the ground is comparatively free from weeds. It should be done when the weeds are most easily destroyed. Two or three additional cultivations during the growing season are usually necessary. All cultivation given after the crop is well started should be shallow, for the bean is a surface feeder and deep cultivation is likely to disturb the rootlets and thus weaken the plant by diminishing the food supply.

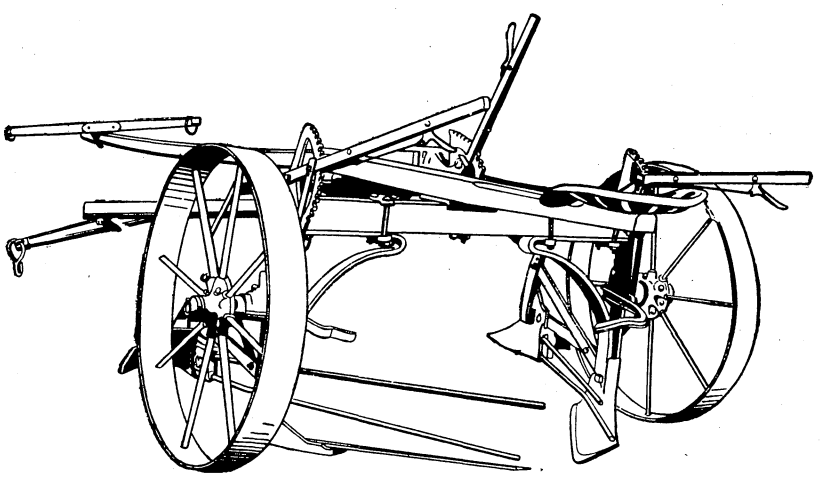

FIGURE 2.—Double-row bean cutter generally used for harvesting the crop.

Implements used in cultivating corn are the ones usually employed in bean culture. Sweeps are substituted for the shovels, as they are better adapted to shallow cultivation. Level cultivation is practiced at all times. Cultivation is discontinued when the vines begin blooming, for the flowers are easily knocked off, and late stirring of the soil keeps the plants growing, making them liable to injury by early fall frosts.

HARVESTING

In the bean-growing districts of Nez Perce and Latah Counties, Idaho, the bean harvest usually begins about September 10. The date varies from August 25 to September 20, according to the season, the altitude, and the varieties grown.

A double-row bean cutter similar to the one shown in figure 2 is generally used for cutting the crop. One man with two good horses can cut from 12 to 14 acres a day with a machine of this kind. The double-row sled bean cutter shown in figure 3 is also a satisfactory implement, especially on steep land, as the runners tend to prevent slipping down the hill. This implement requires three horses.

When the pods have turned yellow and before they have dried out, the vines are cut just below the surface of the ground. Either of the cutters here described cuts two rows at a time and forces the vines into one windrow. Two men with pitchforks follow immediately behind the cutter and place three of the windrows in one row of piles.

The plants are left piled in the field until the vines are thoroughly dry. It seldom takes more than 2 or 3 days for them to become dry enough to be hauled to the bean huller or stacked in the field or in sheds. Stacking materially lessens the danger of damage from rain. It is during the time the beans are lying in piles between cutting and threshing that there is danger of damage from rain. If they are stacked, such damage is not likely to occur as the stacking can begin within a couple of days after the beans are cut, and they are left in piles only a short time. Another advantage of stacking is that the vines go into a sweat soon after they are stacked and do not become thoroughly dry for 3 or 4 weeks after the sweating process begins.

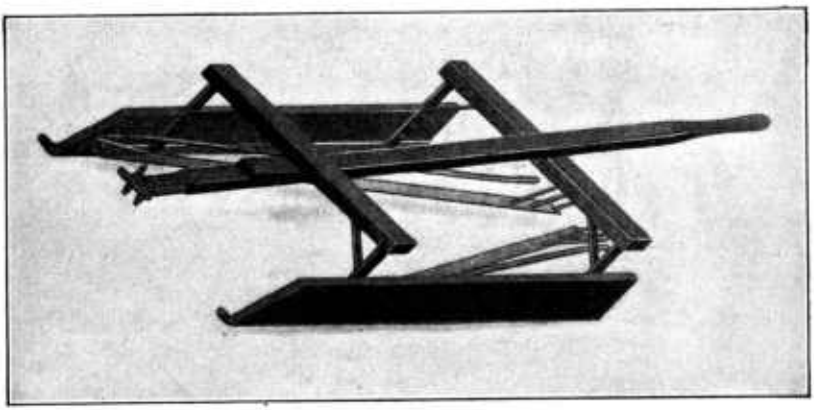

FIGURE 3.—A double-row sled bean cutter.

While in the sweat, the vines, pods, and seed become toughened, and there is less danger of cracking than when the beans are threshed directly from the field.

The side-delivery rake (fig. 4) is now used very generally in harvesting beans in Lewis, Nez Perce, and Latah Counties, Idaho. Two rows of beans are thrown into one windrow by the bean cutter. After the beans are partially dry three of these windrows are thrown together with the side-delivery rake, making a windrow composed of six rows of beans. If good drying weather prevails the beans may be hauled direct from these large windrows to the thresher, stack, or bean shed. On the other hand, if the beans become wet, the windrows may be turned over with the side-delivery rake, or they may be placed in piles. If a rain comes before the beans can be stacked, they are turned as soon as the ground dries. The pods should lie but a short time on the wet earth, as the seeds absorb moisture readily and may become discolored. Care must be exercised in handling the vines after they become thoroughly dry, for the pods crack open easily and much loss may result from shattering.

STACKING

The stacks are built on a layer of straw 12 or 14 inches thick, to keep the pods from coming in contact with the ground. The straw also catches the seeds that are trampled out during the stacking process. The beans are separated from the straw by running both through the huller. Stacks may be kept dry by covering them with heavy canvas or with straw. On the top of the stack the covering should be 12 to 15 inches deep. The straw is held in place by a network of wires or binder twine. Making the cover waterproof is important, for a leak may discolor the beans from the top to the bottom of the stack.

A bean crop may sometimes ripen so late in the season and rains may come so frequently that it is impossible to get the vines dry enough to stack in the usual way. Crops caught in this condition have been saved by stacking in the driest possible condition in narrow stacks about 10 feet wide. During the construction of the stack,

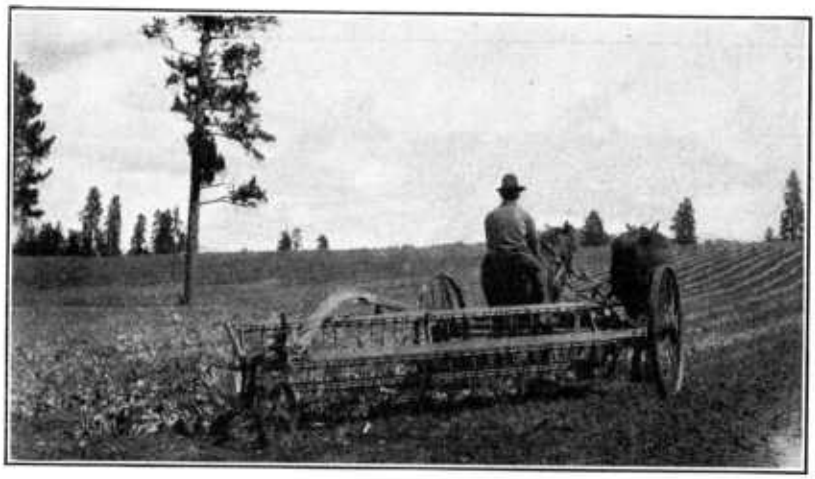

FIGURE 4.—The side-delivery rake used in windrowing beans.

poles, rails, or fence posts are placed in it to allow the beans to have ventilation. They are placed lengthwise of the stack and are separated by layers of beans from 18 to 24 inches thick. As the stacks must stand until the following spring or summer before the beans can be threshed, they must be well covered.

THRESHING

The threshing is usually done with a bean huller, a machine designed to minimize the loss from cracking. Good work can be done with a grain separator, provided the vines have remained in the stack long enough to be in the sweat and the speed of the cylinder is slowed down to 300 or 400 revolutions per minute, the speed depending on the diameter of the cylinder. All but one row of the concave teeth and half of the cylinder teeth are removed, the separating parts of the machine are run at the same rate as when threshing grain, and none of the threshed beans are allowed to pass from the elevator into the cylinder a second time.

In districts in which beans are a staple crop the bean hullers make a regular fall run, as grain threshers. The usual charge for threshing the crop in 1925, for instance, was 50 cents per sack, full sacks weighing from 140 to 150 pounds. This makes the charge about 35 cents per hundredweight. The charge includes all labor connected with threshing except hauling the vines from the field to the machine in case they are not stacked. Growers who have only a small acreage, or who live in a community where there are no hullers, do their threshing with a grain separator or by means of a flail. Two men can flail and clean up about 1,800 pounds a day.

MARKETING THE CROP

Cleaning and grading to get a uniform and attractive product are important items in the marketing of dry beans. As far as the farmer is concerned, this preparation usually ends with the threshing operation. Many of the grain warehouses in the bean-growing districts are equipped with special machinery for this work. The farmer delivers his beans to the warehouse just as they come from the bean thresher and about 6 percent of the thresher run is made up of culls and foreign matter. The farmer receives a load check, and his beans are kept in a separate pile. He then has the choice of selling them in this condition, or having them recleaned, scoured, separated into two grades (large and small), and placed in sacks, which usually weigh 100 pounds each. After this work is done the farmer receives a negotiable warehouse receipt in exchange for his load receipts. The minimum charge for recleaning, scouring, and grading is $2 per ton.

Before the World War affected prices the growers usually received from $3 to $4.50 per hundredweight, the price varying according to the size and quality of the product. The smaller beans are most in demand and generally sell for 25 to 50 cents per hundredweight more than the larger beans.

It is sometimes necessary to hand-pick the crop on account of discolored beans if the harvest season is damp, but weather conditions do not usually make hand-picking necessary if the crop is handled properly. The operation of hand-picking is greatly facilitated by a small machine, operated by foot or other motive power, consisting of a canvas belt 7 or 8 inches wide passing over rollers driven at a low speed. The beans are fed to the belt from a hopper, and as they are carried along the pickers remove the discolored seed and foreign particles. The sound beans pass to the end of the canvas and drop into a sack or other receptacle. The usual charge for hand-picking is 7 cents a pound for the damaged beans picked out.

KINDS OF BEANS GROWN

The beans that have been most generally grown in the districts to which this bulletin is applicable are the large white, the small white, and small red. Because of the damage done to the crop by mosaic in northern Idaho, the "Robust" was introduced. It is a strain of the commercial pea bean selected by the Michigan Agricultural Experiment Station and is very resistant to mosaic. It has practically replaced other varieties in northern Idaho.[2]

[2] For further information concerning the Robust strain of the Michigan pea bean, see Mich. Exp. Sta. Special Bull. Nos. 108 and 129.

IMPROVING THE CROP BY SEED SELECTION

By carefully studying a field of maturing beans a wide variation in the individual plants will be observed. It will be seen that some of the plants are mature, while others are still green; that some are heavily laden with well-filled pods, while others bear only a small number of seeds. On account of this variation it is possible to improve the crop greatly by careful seed selection. The object of such selection is to increase the yield and vitality of the seed, to improve its quality, and to produce plants that will ripen evenly. In certain localities it is also desirable to select early maturing plants in order to shorten the time required for maturing the seed. It is impossible to obtain permanent results unless such selection is practiced every year, for bean plants have a strong tendency, if selection ceases, to return to the original type.

A practical method of seed improvement used by the most successful bean growers is as follows: In starting the work a large number of plants heavily laden with ripe pods are selected from the field at the time of maturity. The plants are taken from parts of the field where the stand is uniform and from soil that is representative of the general soil conditions. Plants from the outside rows or from places where the stand is poor are not representative and must not be used in seed selection.

The plants are pulled by hand, removed from the field, and carefully inspected to obtain the 25, 50, or 100 that are best. These are threshed individually and the beans from each plant are put in separate paper bags, which are numbered.

The following year these selected seeds are planted by hand, a separate row for each paper bag. Toward harvest time this will be the most interesting plat on the farm, since the grower will soon see that when selecting his best plants the preceding fall in many cases he did not "know beans." A number of rows in this plat will be found to have produced progeny which are distinctly inferior in some respect. Here the advantage of these "progeny rows" will be apparent, since the grower is able to discard the bad rows entirely, whereas if he had not planted the seed from each selected plant by itself it would be practically impossible to remove the poorer types by roguing. One or more rows will be found to be markedly better than the rest. All of these good rows should be saved for next year's seed plat. After discarding a few rows which may be distinctly poor, the remainder of the seed plat can be used to plant the field.

By 1 year's individual selection a strain can be established which can be kept fairly pure by discarding all the inferior plants from the seed plat. The plat should be sown each year and should be large enough to furnish all the planting seed needed. The extra labor in threshing which this selection plan requires comes at a time of year when it can be spared, since the selected plants can be stored unthreshed for a while. The labor of hand-planting will be richly repaid by the greater producing value of a selected strain of beans.

BYPRODUCTS

The value of bean straw as a rough feed is not fully appreciated by all growers. Many farmers feed their bean straw, but much of it is burned immediately after threshing. Others allow it partly to decay in large piles and then use it as filling for ditches or as fertilizer. When not allowed to become damp or moldly, bean straw makes an excellent roughage for either sheep or cattle, and when fed in conjunction with grain is a good substitute for hay.

Bean straw is but little inferior in feeding value to wheat, oat, and barley hay. The yield of bean straw per acre is ordinarily from one half to three quarters of a ton. The value of the straw per acre can be estimated closely by using the current prices of grain hay.

Little waste is caused from decay or discoloration of the seed during harvest, but sometimes there is a quantity of cull beans because of the splitting or cracking of the seed during threshing. The culls make good hog feed when thoroughly cooked and fed with other grain.

PRODUCTION IN COMPETING AREAS

The commercial crop of dry edible beans of the United States, as shown by tables 1 and 3, is mainly produced in Michigan, California, Idaho, New York, Colorado, New Mexico, Montana, and Wyoming. The acreage harvested of this crop increased steadily from 1,086,000 acres in 1922 to 2,110,000 acres in 1930, then declined to 1,408,000 acres in 1932, and increased again to 1,671,000 acres in 1933.

The yield of beans per acre by producing States is shown in table 2. The lowest yields are generally obtained where the rainfall is scant and where the crop is grown without irrigation, whereas the highest yields are usually obtained under irrigation.

The total production of the commercial crop and production by producing States is shown in table 3 in terms of bags of 100 pounds each for the period 1927 to 1933. Total production during this period increased from 9,120,000 bags in 1927 to 13,900,000 bags in 1930, and then decreased to 10,440,000 bags in 1932. Total production in 1933 was about 12,280,000 bags.

Total exports of beans from the United States during the crop year beginning September 1, 1923, exceeded total imports by 54,000 bags. During the crop years 1924 to 1930 inclusive, total imports exceeded total exports, the range in net imports per year being from 182,000 bags in 1925 to 1,135,000 bags in 1929. During the period September 1, 1931, to September 1, 1933, total exports of beans from the United States slightly exceeded total imports.

TABLE 1.—*Beans, dry, edible: Harvested acreage, by producing States*

State	1927	1928	1929	1930	1931	1932	1933 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*
Michigan	426	405	575	690	635	495	510
California	296	307	339	363	334	225	275
Colorado	322	374	372	450	351	221	345
New Mexico	159	159	167	169	161	163	176
Idaho	95	114	134	168	178	93	121
New York	75	80	103	124	120	114	117
Montana	24	31	47	49	37	24	35
Wyoming	18	23	31	38	37	19	29
Arizona	8	6	6	8	8	8	9
Nebraska	5	9	9	10	14	14	16
Maine	7	7	8	9	10	8	9
Wisconsin	6	6	8	9	7	6	5
Minnesota	5	5	5	6	7	7	7
Vermont	4	3	3	3	4	3	3
Kansas	----------	6	22	13	9	7	13
Oregon	----------	----------	7	1	1	1	1
United States	1,450	1,535	1,836	2,110	1,913	1,408	1,671

Compiled from official records, Division of Crop and Livestock Estimates, Bureau of Agricultural Economics.

[1] Preliminary.

TABLE 2.—*Beans, dry, edible: Yield per acre, by producing States*

State	1927	1928	1929	1930	1931	1932	1933 [1]
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*
Idaho	1,110	1,020	1,200	1,140	1,170	1,140	1,380
California	948	1,020	1,000	1,175	1,038	1,104	1,280
Montana	1,080	990	960	1,080	960	1,080	960
Wyoming	960	690	960	1,200	1,020	990	1,080
Maine	900	840	720	840	840	780	810
New York	780	840	720	558	1,080	750	720
Vermont	660	660	570	600	600	570	540
Nebraska	690	540	450	690	450	720	720
Michigan	528	660	546	366	540	900	690
Arizona	480	420	480	510	420	450	420
Minnesota	660	540	360	360	390	360	420
Wisconsin	402	510	420	402	240	390	390
New Mexico	510	330	594	270	400	250	340
Colorado	300	270	360	600	258	198	330
Kansas	----------	240	300	720	330	360	360
Oregon	----------	----------	246	720	720	450	600
United States	629	643	667	659	671	742	735

Compiled from official records, Division of Crop and Livestock Estimates, Bureau of Agricultural Economics.

[1] Preliminary.

TABLE 3.—*Beans, dry, edible: Production, by producing States, in bags of 100 pounds each*

State	1927	1928	1929	1930	1931	1932	1933 [1]
	1,000 bags	*1,000 bags*	*1,000 bags*	*1,000 bags*	*1,000 bags*	*1,000 bags*	*1,000 bags*
Michigan	2,249	2,673	3,140	2,525	3,429	4,455	3,519
California	2,805	3,132	3,391	4,264	3,467	2,484	3,520
Idaho	1,054	1,163	1,608	1,915	2,083	1,060	1,670
New York	585	672	742	692	1,296	855	842
Colorado	966	1,010	1,339	2,700	906	438	1,138
New Mexico	811	525	992	456	644	408	598
Montana	259	307	451	529	355	259	336
Wyoming	173	159	298	456	377	188	313
Nebraska	34	49	40	69	63	101	115
Maine	63	59	58	76	84	62	73
Minnesota	33	27	18	22	27	25	29
Wisconsin	24	31	34	36	17	23	20
Vermont	26	20	17	18	24	17	16
Arizona	38	25	29	41	34	36	38
Kansas	----------	14	66	94	30	25	47
Oregon	----------	----------	17	7	7	4	6
United States	9,120	9,866	12,240	13,900	12,843	10,440	12,280

Compiled from official records, Division of Crop and Livestock Estimates, Bureau of Agricultural Economics.

[1] Preliminary.

TABLE 4.—*Beans, dry, edible: Production, by commercial classes, in bags of 100 pounds each*

Class	1927	1928	1929	1930	1931	1932	1933 [1]
	1,000 bags	*1,000 bags*	*1,000 bags*	*1,000 bags*	*1,000 bags*	*1,000 bags*	*1,000 bags*
Pea bean	2,325	2,723	3,339	2,834	3,881	4,827	3,798
Great Northern	1,174	1,253	1,764	2,114	2,030	1,072	1,729
Small White	280	424	415	489	429	226	417
Large White	15	23	21	24	15	4	3
White Marrow	86	112	135	166	212	92	90
White Kidney	52	31	42	39	117	53	56
Red Kidney [2]	428	575	417	345	627	362	433
Yelloweye	114	104	104	81	144	76	90
Pinto	1,772	1,542	2,327	3,174	1,567	893	1,812
Small Red	220	282	393	520	488	258	312
Cranberry	110	106	107	120	147	71	151
Pink	559	578	620	627	433	515	597
Bayo	25	12	12	16	20	3	8
Blackeye	300	428	514	852	459	275	587
Lima	1,010	890	987	1,102	1,064	872	943
Baby Lima	310	401	486	696	663	322	630
Miscellaneous [3]	340	382	557	701	547	519	624
United States	9,120	9,866	12,240	13,900	12,843	10,440	12,280

Compiled from official records, Division of Crop and Livestock Estimates, Bureau of Agricultural Economics.

[1] Preliminary.
[2] Includes Dark Red Kidney.
[3] Includes seed beans of garden varieties.

TABLE 5.—*Beans, dry edible: December 1 farm prices per 100 pounds* [1]

Year	Idaho	Michigan	Colorado	United States	Year	Idaho	Michigan	Colorado	United States
	Dollars	*Dollars*	*Dollars*	*Dollars*		*Dollars*	*Dollars*	*Dollars*	*Dollars*
1922	4.30	5.60	5.60	5.16	1928	6.00	7.45	5.70	6.91
1923	4.55	5.00	4.70	5.26	1929	4.55	6.20	4.50	6.27
1924	5.10	4.85	3.95	5.10	1930	3.00	4.30	2.25	3.89
1925	4.10	4.50	3.60	4.87	1931	1.45	2.10	1.80	2.45
1926	4.35	4.65	4.65	4.87	1932	1.10	1.05	1.50	1.63
1927	4.30	5.00	4.60	4.80	1933	2.00	2.15	2.65	2.71

Compiled from the official records, Division of Crop and Livestock Estimates, Bureau of Agricultural Economics.

[1] Idaho prices reflect fairly well the farm prices for the Great Northern; Michigan prices those for the Pea bean; Colorado prices those for the Pinto; and United States prices those for all dry beans grouped together.

PRODUCTION BY COMMERCIAL CLASSES

The bean crop as a whole is made up of a number of distinct classes which enter into a somewhat complex trade. (See table 4.) The normal demand for several of these classes has become so fixed and well-defined that they are only indirectly competitive. Some kinds of beans are preferred for baking, others for soup, and others in preparing canned products. Futhermore different markets frequently have varying preferences. For these reasons the price of a particular class of beans may react more strongly to the supply of that class than to the supply of the bean crop as a whole.

The beans grown in northern Idaho, the principal district to which this bulletin is applicable, are shipped to the Pacific coast, and to the middle western and the eastern markets where they compete mainly with the Pea bean, grown chiefly in Michigan and New York; with the Great Northern, produced principally in southern Idaho, Montana, and Wyoming; with the Small and Large Whites, grown in California; and with the Pinto, grown in Colorado and New Mexico. When the spread in price between the different classes is considerable, the beans produced in northern Idaho come into competition with other kinds of beans. Table 5 presents December 1 farm prices of beans for Idaho, Michigan, Colorado, and the United States as a whole. The Idaho price reflects fairly well the price of the Great Northern, the Michigan price that of the Pea bean, the Colorado price that of the Pinto, while the United States price represents the average price of the bean crop as a whole.

Production of dry beans can be expanded greatly and quickly in practically all producing areas. This was demonstrated during the World War, when the harvested acreage was increased from 875,000 acres in 1914 to 1,821,000 acres in 1917. To stabilize the industry the acreage planted to the respective classes of beans in the various producing areas should be adjusted carefully to the market requirements of the several classes.

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